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ABSTRACT

This study investigated cognitive processes involved in English-as-a-Second-Language (ESL) students' correcting and revising drafts after receiving oral feedback from their teachers, noting factors that led to better written products and factors that did not improve student writing. The study examined what kinds of revision strategies students used and which strategies they needed to practice. Twelve students wrote and revised essays about their opinions on the death penalty. The essays were assessed and graded by two raters. Students received oral feedback from their teachers, then revised their writing. Students' revision strategies were classified using think-aloud protocols. Teacher-student conferences and writers' verbal reports about their strategies during the rewriting process were recorded, analyzed, and categorized. Results supported previous research findings about the importance of cognitive processes, also mapping out differences between weak and strong writers in terms of revision strategies. Findings suggested that weak language proficiency was not the only factor interfering with the development of writing skills. (Contains 14 references.) (SM)

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How Mind Works to Revise Compositions

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This study investigates cognitive activities involving students correcting and changing drafts after they gain teacher's oral feedback. The purpose is to find the factors leading to better products and/or factors not rewarding rewriting efforts in efficient way. The research method uses think-aloud protocols to analyze the factors although some cognitive researchers debated that mental work cannot be traced and analyzed (Cooper and Holzman 1983; Erricsson and Simon 1987). For it is too complicated for young and inexperienced students to relate what happens in their mind. However, if verbal report is well controlled in succinct way by a researcher useful information can still be collected (Swanson-Owens and Newell 1994). Study of mind is necessary in classroom settings for teachers to help students solve learning problems. Based on this rationale, this study classifies students' revision strategies by using think-aloud protocols. The result will map out differences between weak and good writers in terms of revision strategies. This finding wants to point out that weak language proficiency is not the only factor to interfere growing of writing ability. Very often effective cognitive strategies are vital in the matter of developing writing ability. For instance, it is likely for a student with good grammar or rhetoric knowledge to take longer time to become a good writer when he does not understand how mind can work to *analyze, select, discriminate, and connect* so that efficacy of accuracy and coherence can be achieved. Instead, when he passively re[illegible]ts and reproduces teacher's answers, his mind is sluggish. Slow and dull mind impedes growing of writing ability, which requires active mind.

RATIONALE

When a writing teacher is reading and grading a composition, it is natural for her to judge how good or poor a composition is. However, we seldom contemplate and look into how students correct errors and improve the content. How do students think about errors and weak content? Have they ever developed strategies, skills and ability to correct and improve drafts on their own? Are they able to proofread and revise? What kinds of intellectual assistance or stimuli can be provided for them to rewrite a better composition? On the contrary, most often we think that correction and improvement is a teacher's job. This misperception drives language teacher's nuts when their work is overload. At the same time, students become more and more dependent on teachers. Sometimes when the teacher is too busy, a simple general comment or grade is given to warn or encourage students whether their writing ability is poor or good. Neither ways can provide them with advice about how to write well. This study thus carries out investigation on students' aspect concerning the cognitive process when they are engaging in improving supplementary drafts. When we know more about how students produce a poor work, we can specifically advise weak students the taboos which should not be allowed if they expect to produce a piece of good work. At the same time, through studying how good writers develop a mature ability to detect and diagnose problems in order to strengthen argument, weak writers can learn from good writers how to cultivate efficient habits to accomplish literacy skills and ability.

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LITERATURE REVIEW

Psycholinguistic Perspectives

The cognitive process referred in this study focuses revision as a process of strategy application. Cognitive process is classified as one level of learning strategy with which learners use to comprehend, store and utilize new information and skills (O'Malley and Chamot, 1990: 42-43; summarized by Graham, 1997:3). Efficient learning in this sense is indispensable from effective strategic application in somewhat ways. Quite a number of articles in learning strategy literature have discussed the relationship between cognitive processes and effective learning. Anderson (1985) explains cognitive process as a process of information storage and retrieval when one is generating new information from the old. According to Anderson, selecting, comparing, organizing, evaluating to be a process of internalizing and integrating is also a process of retrieval when old information is stored in the long-term memory. But creating new information needs some high-order strategies to retrieve the old information, which has already been transformed and reserved temporarily in the short-term memory. New information will be created when these cognitive strategies activate the stored information. Anderson and O'Malley thus use "declarative" knowledge to contrast "procedural" knowledge in terms of knowledge creation.

Wenden (1991: 19-21) enumerated four stages to achieve problem solving results, which is identified in this study a process of new information creation. According to Wenden, a learner "comprehends" new components before he can "select" proper ones to amend the problems. The comprehended new knowledge is "stored" in the long-term memory whereas solution knowledge is stored in short-term memory. Whenever a similar problem happens, he "retrieves" the proper solution from the short-term memory. However, Wenden did not explain powerfully how the storage and retrieval process affects problem-solving results. In other words, she did not explain how the four stages end up with effective learning although she clearly pointed out vital factors.

On the other hand, O'Malley and Chamot (1990: 56-83) illustrated this process by contrasting "declarative" versus "procedural" knowledge. When using new information, merely recalling one's prior knowledge as "what" is not enough for generating new knowledge. A learner must follow certain cognitive patterns such as selecting, analyzing, and monitoring to evaluate information from different resources. For instance, when one encounters a problem, he will resort to such mental activity as analyzing different factors, selecting and judging from a cluster of knowledge or experience, deciding one proper chunk to fill up the missing part to make the unit as a whole. At the same time he may elaborate old information by adding new details which are relevant to the goal he is working with. It is likely that he compares and contrasts in order to link similar items to organize a number of ideas in one category. The cognitive process such as *selecting, analyzing, evaluating, deciding,* as well as *comparing* in order to organize and elaborate involves one's internalizing and integrating skills. In this sense, O'Malley and Chamot includes more details to explain cognitive process.

This study integrates O'Malley and Anderson's cognitive theory to investigate writer's mental process. For instance, a writer needs old information to identify the nature of the mistakes or weak content. Grammar, lexical usage, other mechanical regulations are stored in the LTM. Cognitive strategies such as recalling (remembering), analyzing, selecting and judging can be used when editing mistakes or revising content. The result as a different unit also known new information thus turns out. Accordingly, revision in this study

involves information storage and retrieval process. Because of this process, procedural knowledge is established to make learning acquired and matured. In a writing class, the acquired new information is regarded as student's independent ability from diagnosing mistakes and weakness to be able to correct errors and elaborate ideas.

Scardamalia and Bereiter (1987) emphasize the importance of this change from knowing "what" to knowing "how" and "why" for L1 children to develop writing ability. Accordingly, it is assumed wrong if we simply tell our L2 students, "too many grammatical mistakes, " "use *past tense*," "further development is needed," and so forth. But it is right for us to ask our students, say, "why *past tense* is wrong here?". Question like this makes students go through storage and retrieval process which enables students learn to solve problems on their own by experiencing several cognitive processes. Conformably, this study aims to investigate three main inquiries:

1. What kinds of revising strategies EFL writers may employ?
2. What revising strategies are used most frequently?
3. What revising strategies EFL writers need to practice in order to develop

METHODS

Participants and instruments

Twelve students were asked to write and revise the essays about their opinions on the death penalty. The students' essays were assessed and graded by two raters. Among them, writers 1,2,5,3,4 were classified to be good writers; writers 7,8,9,10,11 intermediate writers; writers 6 and 12 weak writers. Oral feedback was conducted in writing conference, which continued about half an hour for each student. To help writers revise form and content, two conferences were conducted for each writer. The students were asked to revise the content in their second draft and edit language errors in the third. Teacher/student oral interaction as well as the writer's verbal report during rewriting process were recorded and transcribed for quantitative and qualitative analysis.

Think-Aloud Protocol

A think-aloud protocol is one type of concurrent introspective and retrospective verbal report about the process of thinking. It is a method used to study cognitive process by analyzing language learning behavior such as the writing process. Flower and Hayes (1981) claimed that protocol analysis through the use of hierarchical rather than linear description is a better instrument to study the recursive nature of writing processes. However, some researchers (Cooper and Holzman 1983) severely criticized validity and reliability of the collected data from verbal reports and hence questioned how they can be used as evidence of the inner process of our interlangauge development. Their reason was that the process of our unconscious attention couldn't be precisely reported through our general knowledge. Their questioning is proper because faulty or distorting report may happen.

Findings from my pilot studies have shown that the four writers were not accustomed to rewrite the drafts and recite simultaneously their cognitive process. Thus, a limited amount of useful data was generated. Although retrospective interviews were given after writing, most answers were about the writer writing experience rather than how she revised. Only limited conversation was devoted to the discussion of the revising process particularly

in terms of how and why the corrections or changes were made. Due to this unsuccessful outcome, more literature was reviewed to find out how to improve conducting think-aloud techniques.

Many studies show techniques and controls, which can reduce and prevent unnecessary interference and assure investigators of gaining the reliable data they want. Several techniques such as training and retrospective interviewing after think-aloud are suggested (Cohen 1987; Erricsson and Simon 1987). Swanson-Owens and Newell (1994) suggest "intervention" through interview by "questions" after the writer finishes one paragraph. This method is considered a competent one since it revives the writer's cognitive process, which was suppressed due to nervousness or other affective factors like motivation or confidence. Swanson-Owens and Newell also explained that intervention might not cause changes or interference to a writer's verbal report because how revision is made is still retained vividly in the writer's short-term memory.

Under this circumstance, a researcher works with informants when they are solving problems. It is easy for informants to report "solutions" rather than "explaining" how solutions are made. The pilot studies carried out here revealed that these writers very often read the corrected sentences or rewritten paragraphs after a period of silence and pause, but forgetting to explain how and why the changes or corrections were made. If the investigator stays with the informant during the thinking-aloud process, the informant can be reminded when he or she strays from the right direction.

CLASSIFICATION SCHEME

During the revising process, writers sometimes used some strategies to make corrections and changes. If the used strategies can correct mistakes correctly and elaborate ideas to bring about meaningful and significant content, these strategies are termed "positive strategies". Those are such descriptive operators defined to be *parsing*, *associating* and *discriminating* which are employed to correct local errors. On the other hand, *analyzing*. and *matching* are employed for negotiating discourse meaning. These positive strategies help EFL writers upgrade their writing ability through long-term development since they understand *why* they are using their knowledge appropriately to produce acceptable work. The consequence corresponds with De Guerrero and Villamil's (1994) finding that good EFL writers usually perform actively with their cognitive strategies known as self-regulatory strategies to solve problems by themselves after receiving stimuli from peers.

In contrast, sometimes when writers repeated the correction or rewriting done by the teacher but they are unable to justify their corrections, the employed cognitive strategies such as '*listing*' or '*reproducing*' are considered "passive". Passive strategies cannot make correct answers stay in long-term memory. As soon as correction behavior is completed, independent chunk as grammar, vocabulary or punctuation is removed from short-term memory. Consequently, nothing can enter into long-term memory and thus *forgetting* is raising.

Apart from these two strategies, sometimes these writers abandoned corrections and changes of discourse meaning. *(No corrections* and *no changes* were the terms used in such situations.) Abandoning indicates no cognitive attention is involved during the problem-solving process. The predicament encountered by those who employ passive strategies is that the learning process is slowed down or impeded since the learners cease to use mental ability to solve problems. These lower-level strategies restrict active involvement of the information storage and retrieval system. In the long run, passive strategies do not benefit long-term development of learning i.e.writing ability.

Positive and Passive Strategies

1. *Parsing* : The writer recalled grammatical knowledge when analyzing relationships between different linguistic components e.g. subject and verb. Sometimes this knowledge was used to analyze relationships between main and subordinate clauses to decide on the use of capitalization, conjunction and/or punctuation, and vice versa. The analytical judgment must be based on the writer's linguistic knowledge. Example: \...bad thing...mistake...\ bad *things*... \ because I say many problems like eyes and health....\ besides 'many' indicates more than one problem...\
2. *Associating:* The writer described the concept s/he wants to express, associated the concept with several synonyms, judged differences according to the contextual meaning, then selected the appropriate one. Example: \...to grasp new information and knowledge...\...redundancy...ok...to grasp new information...\...information and knowledge... the same meaning...\ but information better...fits this context \
3. *Discriminating Morphological Forms and Collocations:* The writer discriminated between several speech parts to make morphological changes by judging the functions of a word in a sentence. Sometimes the writer discriminated an idiom which needs a special preposition to form meaning. The writer had to choose a correct pair to create the contextual meaning. Example: \... they may not have enough time to do other outdoors activities...\ outdoors...wrong...(check dictionary)...outdoor adjective...\outdoors...adverb...\ I need adjective before a noun...\ ok 'outdoor' activities...\
4. *Listing*: The writer listed several words, which shared one similar meaning then chose the one that s/he thought was better. Unlike associating, s/he did not explain why the chosen word better represented the concept suitable for the context. Expression such as *'this is better'* indicated her or his decision but nothing concerning an undergoing cognitive process was revealed.
5. *Reproducing:* The writer repeated the teacher correction. S/he noticed that the correction was different from the error, but could not explain the reason. Expression such as *'I don't know'* indicated a mere reproduction of the teacher's correction.
6. *Analyzing:* The writer analyzed the rhetorical structures of the main and between a general concept and its specific details. To perform this task, the writer identified facts, evidence, data and examples by asking *what, why, how,* and *when* questions to discover what supporting ideas were missing so that new sentences should be added. Example: \if they can keep their lives... \ then *what* will happen....\ they still can be changed'...\ *what* does this mean...\ they can do some penalty....\ no...\ they can do something for it...\ *why*..\... do something to redeem their own sins....\ yes...to show their sorrow in actions...\
7. *Matching:* The writer investigated the compatibility of several ideas. S/he arranged these ideas as in the relationship between cause and effect. At the same time, ideas were organized in acceptable sequences such as grouping similar ideas together or deleting ideas, which contradicted the adjoining ones. Example: ... now how can I make the conclusion ...\ ... what I say in the third paragraph is not enough...\ maybe it should be combined with the facts in the fourth paragraph...\ that right ...\ the third and fourth paragraphs actually are describing the disadvantages of d.p. ...\ they should belong together...\ first... d.p. cannot provide stop crimes...\ second...d.p. cannot decrease pain...\
8. *Uncorrected errors and/or unchanged meaning*: They were identified when no revision had occurred. The common criteria to decide whether there were

uncorrected errors or unchanged meaning was decided by the writers' silence or expressions such as " I don't know how to correct it," or " I don't know how to make my ideas clear," thus leaving the errors or problems untackled.

RESULTS AND DISCUSSION

The categorized strategies were counted their occurrence frequency. The descriptive statistical figures are reported on Table 1 in terms of positive and passive strategies regarding linguistic errors and discourse meaning. The figures show that *parsing* is the most frequently used strategy (44%=224). It means that these writers depend substantially on their grammar knowledge when correcting local mistakes. To achieve this goal, they must be able to identify standard English sentence structures, which syntactically are different from Chinese in terms of discourse meaning. Meanwhile, 15% (40+36) of the employed strategies are *associating* lexical usage and *discriminating* mechanical differences and faults. These figures make the total positive strategies for linguistic corrections to be 59%. By contrast, 31% (86+44+26) of the employed revision strategies are passive strategies like *listing, reproducing,* and *no correction.*

Table 1.
Occurrence Frequency of Revision Strategies

	Linguistic Errors						Discourse Meaning			
W	P	AS.	D	R	L	NC	AN.	M	NCH	Total
1	29	5	3	2	0	6	1	3	0	49
2	34	7	4	2	3	8	0	3	0	61
3	15	3	2	3	0	5	1	2	0	31
4	20	4	3	2	0	3	1	1	0	34
5	34	5	7	5	5	9	1	1	0	67
6	11	2	3	13	4	18	0	4	0	55
7	23	4	3	4	0	7	1	1	0	43
8	13	3	2	0	2	0	5	2	2	29
9	10	1	2	0	2	1	3	2	0	21
10	10	2	1	2	2	2	2	2	4	27
11	11	4	2	4	3	5	1	3	3	36
12	14	0	4	7	5	21	1	2	2	57
Total	224	40	36	44	26	86	17	26	11	510

Abbreviation: W=Writer; Parsg.=P ; As.=Associating; D=Discriminating; R=Reproducing;

NC=No Corrections; L.=Listing; An.= Analyzing; M=Matching; NCH.= No Changes

The statistical figures (59% versus 31%) reveal the fact that passive strategies do occur in significant portion and can affect long-term development of writing ability since the writer's revised drafts do not improve. The reason behind unimproved tasks is because one's problem-solving strategies are not activated.

Additionally, the figures also show that good writers use more frequently positive strategies than weak writers. For instance, writer 1, 2, 5 (good writers) employed 39, 48 and 48 positive strategies whereas writers 6 and 12 (weak writers) employed 20 and 21 positive strategies. On the other hand, writer 1, 2, 5 employed 8, 13, 19 passive strategies whereas

writers 6 and 12 did so by 35 and 33. Using more passive strategies prevents weak writers from developing writing skills and ability unto higher level. This finding corresponds with the previous one. Whenever higher-order strategies are used less frequently, problem-solving activities cannot be so powerfully activated that learner's mind is slowed down in acquiring new information or skills.

Rhetoric and Knowledge-Transforming

With regard to content improvement, Table 1 also shows that 8% (26+17) of the employed strategies are positive strategies of *matching* and *analyzing* whereas 2% (11) is the passive strategy of making *no changes*. When content was not satisfactorily expanded, it was suspected that some of these writers were not able to use positive strategies at sophisticated level. A detailed analysis on the think-aloud records reveals that how to use *analyzing* and *matching* strategies can differentiate good and weak writers.

The think-aloud protocol contrasts strategies used between good and weak writers. It is found that good writers can use cause-effect relationship such as asking "why" questions by uncovering essential reasons or telling "what will happen" to enumerate outcomes. For instance, Writer 1 identified the *cause and effect* relationship between death and life sentences. According to her, if a criminal could stay alive, what would happen to him? He would be asked to repent for the wrong deed he had committed. The final effect would be for him to develop right behavior within the law. During revising process, writer 1 asked a series of such questions as "causes", "consequences" and "purposes" which interacted as a chain to help link several ideas systematically and logically so that clarity of meaning was better constructed than the first draft. In addition, "helpful solutions" contrasting with "the death sentence" is another logical relationship to argue that the "death sentence" is not the only solution to crime prevention. Consequently, this statement opens up the possibility of better options, which the writer could have included in her discussion.

A second example is Writer 7 who revealed how she organized her ideas through a "general to a specific" order by using the *analyzing* strategies. She firstly identified her attitude as objecting to the death penalty - " *I disagree with the death penalty,"* as she revealed in the think-aloud process. " *It is hard to say that the death penalty is a good way to punish criminals. On different standpoints, we will have different views,* " she declared so in her revised text. From this general statement, she then formulated two questions, which she presented as the two main topic sentences for each of the forthcoming two paragraphs to argue why she thought that the death penalty should be abandoned. The two questions were related to the disadvantages of the death penalty. She argued that the death penalty could not reduce pain or the crime rate. Her opposing to the death penalty being her position was revealed in a general statement. On the other hand, her two questions are the two specific points that she was about to provide further evidence to support her standing.

The third example is writer 12. Although writer 12 had employed two matching and one analyzing strategies, the revised content did not bring about satisfactory improvement. The teacher commended him to make a writing plan to decide his position on this issue, but not to give contradictory reasons to provoke disagreement from readers. The teacher also commented that the argument was still very general and hard to convince people to agree with him. He suggested some specific evidence from newspapers. However, "planning", "goal-setting", "consistency" and "specific evidence" are too ambiguous conceptions for Writer 12 to formulate cognitive patterns in terms of creation of new ideas. He ended up with word for word translation. Novice writers at lower-level strategy experience fragment translation (O'Malley and Chamot: 40). Unlike Writer 1 and 7, Writer 12 did not resort to

cause-effect or general-specific relationships between ideas. The analyzing or matching strategies he employed derived from his reliance on the first language. He overlooked the logical aspects of the target language. The revising result achieved by him was small-scale alteration that did not significantly affect overall meaning of the context. Because of lower-level cognition, it is difficult for weak writers to cope with global and contextual meaning.

Planning and Knowledge-Transforming

The three diagrams below contrast the thought patterns that these three writers observed when organizing ideas. The first two diagrams (1 and 2) share a similar pattern between writers 1 and 7. Most importantly, this pattern reveals clear sequence of how ideas are arranged. Due to this sequence, ideas are organized in logical order by means of discussing the relationship between a cause and its effects. The third diagram illustrates how writer 12 formulated his ideas. Unfortunately, this pattern does not show clear relationship of several ideas. The vague relationship makes the ideas existing separately without connections to each other (as the dot lines show) hence disorder impedes the writer from creating more ideas. Diagrams (1,2) reveal good writers can organize ideas more systematically than weak writers can when additional details are provided to support a general claim.

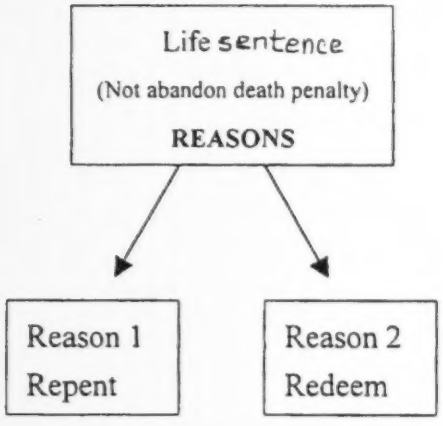


Diagram 1: Logical Relationship of Ideas by Writer 1

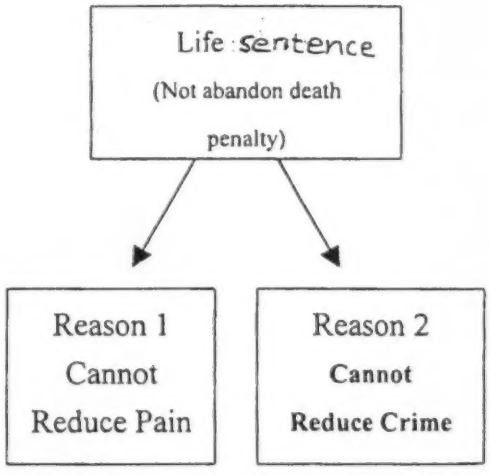


Diagram2: Logical Relationship of Ideas by Writer 7

This finding corresponds with Flower's discussion (1981:379;1987:197-200) that planning and organizing are employed most often by good writers since they have experienced with these two skills to complete satisfactory work. On the other hand, weak writers have not developed sophisticated skills such as planning, goal setting or organizing. Diagram 3 shows such a weakness.

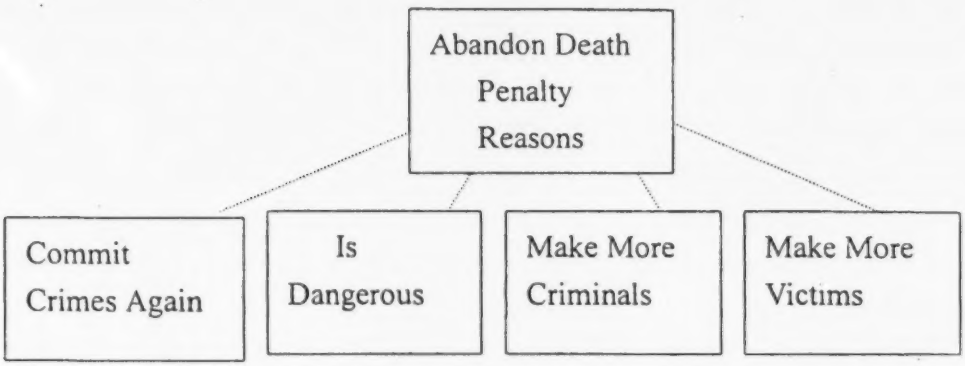
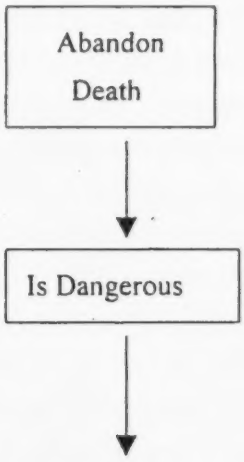


Diagram 3.: Flaws of Idea Development by Writer 12 – In Random Order

A passive strategy like this distracts cognitive efforts from the theme that a writer intends to argue. Instead, distraction diverts the writer to strive with irrelevant schemes and loads his mind with redundancy. Diagram 4 reforms the thought patterns according to a planning scheme, which connects major ideas to develop ideas in logical relationship, and thus creates meaning for the content.

IMPLICATION AND APPLICATION

The finding of this study supports Scardamalia and Bereiter's (1987:358-364) argument about the importance of cognitive processes although their research is about L1 children writers. For instance, abandoned correction or change occurs because weak writers are still exercising passive i.e. "reproducing", "listing" or lower-level positive strategies as preceding discussion explains. Repeatedly using these strategies cannot activate learner's cognitive process to solve complex problems. Their learning experience remains in *knowledge-telling* stage when they are reproducing or listing the same information provided by teachers. They know "what" problems they are encountering, but don't know that they can solve these problems by asking "why" and "how" questions. Weak writers cannot perform complex problem solving strategies because they have had no previous experience of practicing *"knowledge-transforming"* procedures i.e. planning or organizing strategies. Under these circumstances, weak learners are used to deal with simple and small amount of information rather than internalizing abstract concepts to integrate various variables into a whole and complete unit.



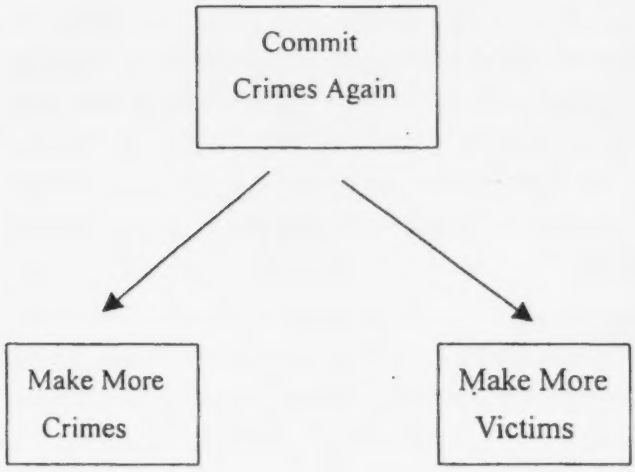


Diagram 4.: Revised Idea Development in Logical Relationship

Weak writers' dilemma demands teacher's concern particularly when quite a number of these writers could be a potential good writer. Therefore, EFL students need to be instructed in their writing lesson strategies to think effectively, analytically and creatively. The instruction about learning strategies is also urged by our writing teachers in Taiwan (Tsai 2000; You 2000). Teaching these strategies involves many lessons include English sentence analysis, English morphology, using English dictionary, English rhetorical structure, mapping and outlining idea, theme and topic sentence, specific evidence, information organization, and so forth. Moreover, the way teachers provide feedback should be cognition-orientated rather than fact-telling or focusing trivial details.

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